

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BOX PATENT APPLICATION

The Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application
of: **Tsun-Tying HSU**

Title of Invention: **ELECTRIC QUANTITY INDICATOR FOR AN
ELECTROMOTIVE VEHICLE**

Enclosed are:

A specification and 6 claims.

Three (3) sheets of formal drawings (Figs. 1-5).

A Combined Declaration and Power of Attorney

Two Assignments

Two verified statements to establish small entity status
under 37 CFR § 1.9 and 37 CFR § 1.27.

The filing fee has been calculated as shown below:

FOR:	NO. FILED	NO. EXTRA	SMALL ENTITY RATE	FEE	LARGE ENTITY RATE	FEE
BASIC FEE			\$380.		\$760.	
TOTAL CLAIMS	6 - 20	0	\$ 09.		\$ 18.	
INDEP CLAIMS	1 - 3	0	\$ 39.		\$ 78.	
0 MULTIPLE DEPENDENT CLAIMS			\$130.		\$260.	
TOTAL			\$380.			

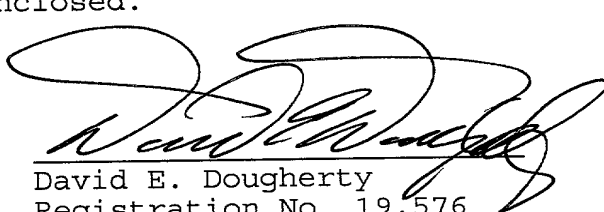
For payment of the above-calculated filing fee and Assignment
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A check in the amount of **\$460.00** is enclosed.

The Commissioner is hereby authorized to charge any
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copy of this paper is enclosed.

December 15, 1999
Date

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David E. Dougherty
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JC688 U.S. PTO
09/460974
12/15/99

12/15/99
JC688 U.S. PTO

Applicant or Patentee: INDEX ELECTRONIC CO., LTD. Attorney's 3079/40
 Serial or Patent No.: _____ Docket No. _____
 Filed or Issued: _____
 For: ELECTRIC QUANTITY INDICATOR FOR AN ELECTROMOTIVE VEHICLE

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
 STATUS [37 CFR §1.9(f) and 1.27(b)] - SMALL BUSINESS CONCERN

I hereby declare that I am:

☒ the owner of the small business concern identified below:

☐ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN INDEX ELECTRONIC CO., LTD.
 ADDRESS OF CONCERN No. 111, Nanshan Rd., Sec. 1, Luchu, Taoyuan, Taiwan, R.O.C.

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR §121.3-18, and reproduced in 37 CFR §1.9(d), for purposes of paying reduced fees under Sections 41(a) and 41(b) of Title 35, United States Code, to the Patent and Trademark Office inasmuch as the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement: (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year; and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with respect to the invention described in the above-captioned:

☐ PATENT

☒ APPLICATION

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR §1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR §1.9(d) or a non-profit organization under 37 CFR §1.9(e).

* NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities (37 CFR §1.27).

FULL NAME _____
 ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NON-PROFIT ORGANIZATION

FULL NAME _____
 ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NON-PROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of my change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate [37 CFR 1.28(b)].

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INDIVIDUAL SIGNATORY Tsun-Tying HSU
 TITLE OF SIGNATORY OTHER THAN OWNER _____
 ADDRESS OF SIGNATORY No. 111, Nanshan Rd., Sec. 1, Luchu, Taoyuan, Taiwan, R.O.C.
 SIGNATURE J. J. / Lam DATE December 13, 1999

Applicant or Patentee: FAIRLY BIKE MANUFACTURING Attorney's 3079/40
 Serial or Patent No.: _____ Docket No. _____
 Filed or Issued: _____
 For: ELECTRIC QUANTITY INDICATOR FOR AN ELECTROMOTIVE VEHICLE

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
 STATUS [37 CFR §§1.9(f) and 1.27(b)] - SMALL BUSINESS CONCERN

I hereby declare that I am:

☒ [X] the owner of the small business concern identified below:

☐ [] an official of the small business concern empowered to act on behalf of the concern identified below:

FAIRLY BIKE MANUFACTURING Hsien, Taiwan, R.O.C.

NAME OF CONCERN

ADDRESS OF CONCERN No. 4, Shen Lih St., Tu Chen Industrial Zone, Tu Chen City, Taipei

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR §121.3-18, and reproduced in 37 CFR §1.9(d), for purposes of paying reduced fees under Sections 41(a) and 41(b) of Title 35, United States Code, to the Patent and Trademark Office inasmuch as the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement: (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year; and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with respect to the invention described in the above-captioned:

☐ [] PATENT

☒ [X] APPLICATION

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR §1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR §1.9(d) or a non-profit organization under 37 CFR §1.9(e).

* NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities (37 CFR §1.27).

FULL NAME _____
 ADDRESS _____

☐ [] INDIVIDUAL

☐ [] SMALL BUSINESS CONCERN

☐ [] NON-PROFIT ORGANIZATION

FULL NAME _____
 ADDRESS _____

☐ [] INDIVIDUAL

☐ [] SMALL BUSINESS CONCERN

☐ [] NON-PROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of my change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INDIVIDUAL SIGNATORY

Jen-Shong CHIEN

TITLE OF SIGNATORY OTHER THAN OWNER

Taipei Hsien, Taiwan, R.O.C

ADDRESS OF SIGNATORY

No. 4, Shen Lih St., Tu Chen Industrial Zone, Tu Chen City,

SIGNATURE

DATE

Dec. 13, 1999

ELECTRIC QUANTITY INDICATOR FOR AN ELECTROMOTIVE VEHICLE

FIELD OF THE INVENTION

5

The present invention relates to an improvement of the electric quantity indicator for an electromotive vehicle, and especially to a electric quantity indicator without measuring a virtual voltage due to increment of voltage of battery as the battery is stopped.

10

BACKGROUND OF THE INVENTION

Since the resource of earth is finite, and combustion will induce air pollution in the environment. The convention way for deriving power from oil is replaced by electric power which is suitable for the requirement of environmental protection. For example, the electromotive vehicle is an apparent example. However, The power supplies are not popular in many places, moreover, power can not be supplied as the oil used in the prior art. A large charging time is required and amount of power can not be seen from the outlook. Therefore, current detector is required for the driver because no one hopes to push an electromotive vehicle in the midway due to exhaustion of power from a fault indication.

Fig. 4 shows a prior art electric quantity indicator, wherein in the initial position, a voltmeter is installed. The measuring result is indicated by a scale for viewing the storage electric quantity so as to estimate traveling length of the electromotive vehicle. As the user is at home, he (or she) may charge the battery in order to avoid as the power is exhausted in the midway. However, such a design has some defects so that the real electric quantity can not be indicated. Since as a battery is stopped and rests for a period of time, the voltage will

increase so as to present a virtual voltage as shown in Fig. 5. Thus, in the prior art, it is possible that the indicator shows that 90 percents of power are stored, but practically, only 30 percents of power are stored. Therefore, user will make a mistake due to a fault indication, even the
5 car stops in the midway so that the driver must push car along the way.

SUMMARY OF THE INVENTION

Accordingly, the primary object of the present invention is to
10 provide an electric quantity indicator for an electromotive vehicle, which can show the real electric quantity.

In order to achieve the aforesaid objects, the present invention provides an electric quantity indicator for an electromotive vehicle comprising: an electric measuring wire parallel connected to a battery;
15 a feedback circuit connected between a motor of the power supply load and the electric measuring wire; and a meter responded to the quantity of electricity of the electric measuring wire. The meter is an electronic display panel, and the feedback circuit and the electric measuring wire are installed with analog to digital (A / D) converters for address
20 dividing to the value in a memory, in which this value is displayed in the aforesaid meter. Thereby, as a load is actuated and power is consumed, the feedback circuit will detect and the electric measuring wire will conduct, real power storage is displayed on the meter so as to be viewed by a user. Therefore, the condition that due to an error of
25 electric quantity, the user can not know the real the electric quantity and thus the car is stopped owing to exhaustion of electric power is avoided.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when
30 read in conjunction with the appended drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a circuit diagram of the first embodiment about the quantity of electricity indicator according to the present invention.

Fig. 2 shows a circuit diagram of the second embodiment about the quantity of electricity indicator according to the present invention.

Fig. 3 is a schematic view showing the display of the converted value in the second embodiment of the present invention.

Fig. 4 is a circuit diagram of a prior art of a quantity of electricity indicator.

Fig. 5 shows a coordinate of the equal quantity of a battery.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figs. 1 and 2, the quantity of electricity indicator of an electromotive vehicle according to the present invention is illustrated, which comprises:

An electric measuring wire 1 is parallel connected to a battery 5.

A feedback circuit 3 is connected between the motor of the power supply load 2 and the electric measuring wire 1.

A meter 4 responded to the quantity of electricity of the electric measuring wire 1.

In the first embodiment, the meter 4 is a simple non-reset meter which is connected in series to the electric measuring wire 1. An amplifier 31 is installed at the feedback circuit 3 for amplifying signals. The output of the amplifier 31 can actuate a control switch 32 to control the electric measuring time for the conduction of the electric measuring wire 1.

Thereby, with reference to Figs. 1 and 5, in the design of the present invention, as the motor of the load 2 is actuated and a large current is generated, the feedback circuit 3 detects to conduct the control switch 32 so that the electric measuring wire 1 conduct. Then,

the electric quantity is displayed on the quantity of electricity indicator for being viewed by user. Since a non-reset electric meter is used and feedback detection is only used in large current. After detecting, the displayed electric quantity will not restore without any response to the
5 virtual current generated from the battery 5 which is switched off. Other than a large current generates so that the current electric quantity is reduced, the data on the meter 4 may response the real electric quantity stored in the battery 5 for being viewed by the user. Therefore, in the prior art application, due to an error of electric
10 quantity, the user can not know the real the electric quantity and thus the car is stopped owing to exhaustion of electric power.

With reference to Figs. 2 and 3, the second embodiment of the present invention is illustrated. The meter 4 can be an electronic display panel. The feedback circuit 3 and the electric measuring wire 1
15 are installed with respective an A / D converters for corresponding to a recording value 62 dividing by an address 61 in memory 6 so that the value is displayed on the meter.

In order that the meter 4 can response the storage of battery 5, in control, the feedback circuit 3 must used to measure in a large current.
20 Moreover, the recording value 62 in the memory 6 only reduced as the battery 5 changes from a high voltage to exhaustion of all power. If the battery is stopped so that voltage increass, it will not be recorded except that the battery 5 is charged and voltage is increased to a certain value (for example, a maximum value of charge saturation),
25 then the memory 6 will reset REST to record the high value again. Therefore, an error due to virtual voltage is avoided.

Although the present invention has been described with reference to the preferred embodiments, it will be understood that the invention is not limited to the details described thereof. Various substitutions
30 and modifications have been suggested in the foregoing description, and others will occur to those of ordinary skill in the art. Therefore, all

such substitutions and modifications are intended to be embraced within the scope of the invention as defined in the appended claims.

What is claimed is:

1. An electric quantity indicator for an electromotive vehicle comprising:
an electric measuring wire parallel connected to a battery;
5 a feedback circuit connected between a motor of the power supply load and the electric measuring wire; and
a meter responded to the electric quantity of the electric measuring wire;
thereby, as a load is actuated and power is consumed, the feedback
10 circuit will detect and the electric measuring wire will conduct, a real power storage is displayed on the meter so as to be viewed by a user.
2. The electric quantity indicator for an electromotive vehicle as claimed in claim 1, wherein the electric meter is a nonreset electric
15 meter and is serially connected to an electric measuring wire, and an amplifier is installed in the feedback circuit, the output end of the amplifier serves to actuate a control switch for controlling the conduction of the electric measuring wire to measure electric quantity.
- 20 3. The electric quantity indicator for an electromotive vehicle as claimed in claim 1, wherein the meter is an electronic display panel, the feedback circuit and the electric measuring wire are installed with analog to digital (A / D) converters for address dividing a value in a memory, in which this value is displayed in the aforesaid
25 meter.
4. The electric quantity indicator for an electromotive vehicle as claimed in claim 3, wherein the recording value only reduces with respect to the voltage measurement, in measuring, as the voltage is increased, it will not response to this state.
- 30 5. The electric quantity indicator for an electromotive vehicle as claimed in claim 3, wherein in charging, the recording value is re-

record a high value as the voltage increases to a certain level.

6. The quantity of electricity indicator for an electromotive vehicle as claimed in claim 5, wherein the re-recorded high value is a charging saturation value of a battery.

ABSTRACT

An electric quantity indicator for an electromotive vehicle comprises an electric measuring wire parallel connected to a battery; a
5 feedback circuit connected between a motor of the power supply load and the electric measuring wire; and a meter responded to the quantity of electricity of the electric measuring wire. The meter is an electronic display panel, and the feedback circuit and the electric measuring wire are installed with analog to digital (A / D) converter for address
10 dividing the value in a memory, in which this value is displayed in the aforesaid meter. Thereby, as a load is actuated and power is consumed, the feedback circuit will detect, and the electric measuring wire will conduct, a real value about the power stored in the battery is displayed on the meter so as to be viewed by a user. Therefore, the condition that
15 due to an error of electric quantity, the user can not know the real the electric quantity and thus the car is stopped owing to exhaustion of electric power is avoided.

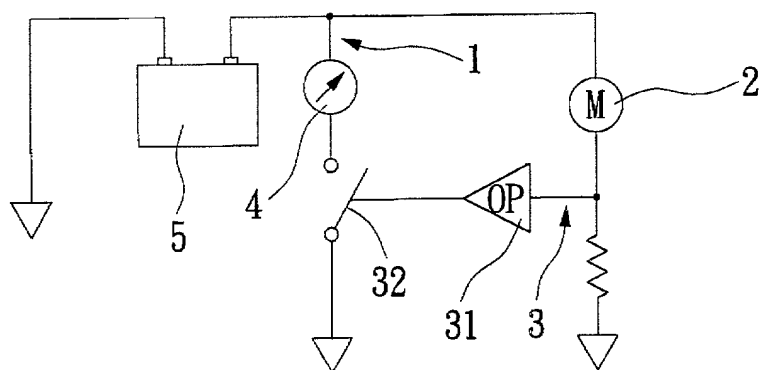


Fig. 1

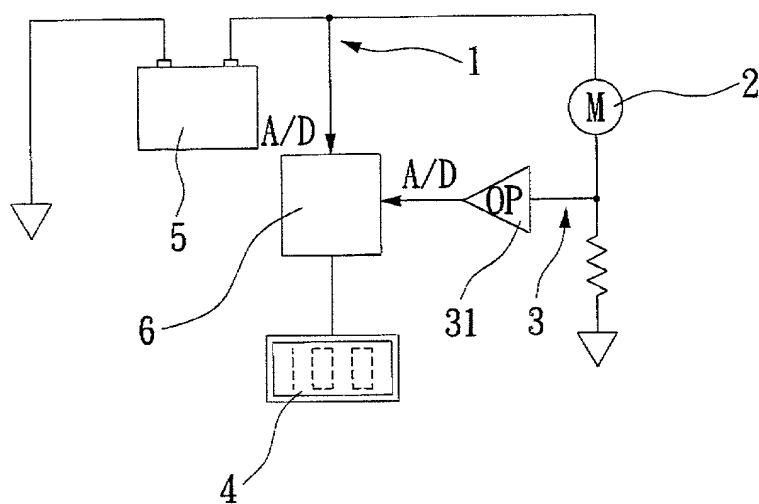


Fig. 2

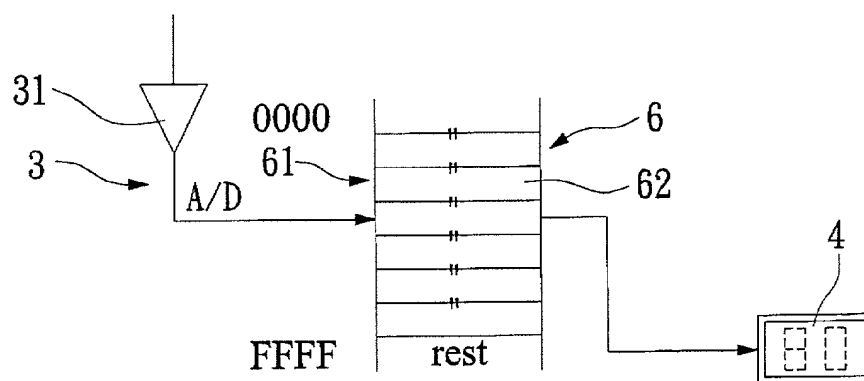


Fig. 3

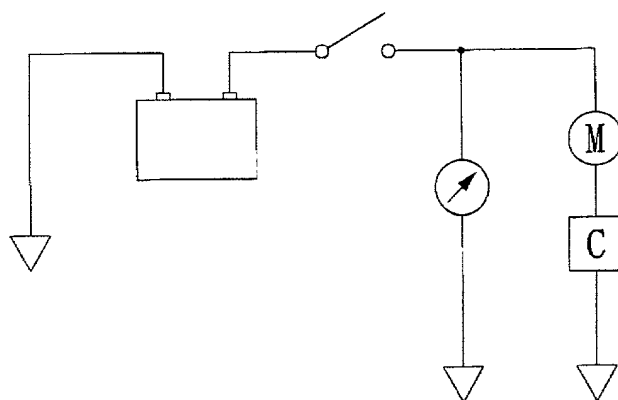


Fig. 4

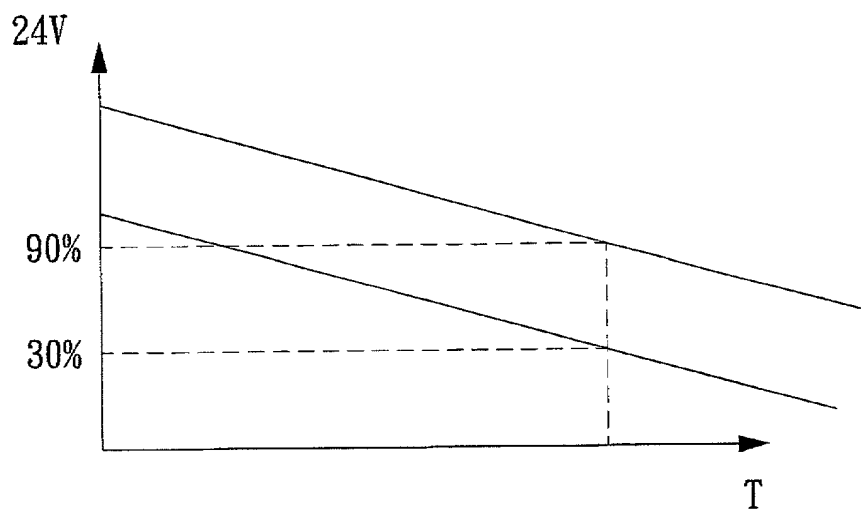


Fig. 5

**COMBINED DECLARATION AND POWER OF ATTORNEY
IN ORIGINAL APPLICATION**

ATTORNEY
DOCKET

3079/40

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

ELECTRIC QUANTITY INDUCATOR FOR AN ELECTROMOTIVE VEHICLE

the specification of which (check one)

_____ is attached hereto.

_____ was filed on _____ as Application Serial No. _____

and with amendments through _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which may be material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

EARLIEST FOREIGN APPLICATION(S), IF ANY, FILED WITHIN 12 MONTHS PRIOR TO THIS APPLICATION

Country	Application No.	Date of Filing	Date of Issue	Priority Claimed	
		(day month yr.)	(day month yr.)	YES	NO
Taiwan, R.O.C.	87220914	16 Dec. / 1998		X	

ALL FOREIGN APPLICATIONS, IF ANY, FILED MORE THAN 12 MONTHS PRIOR TO THIS APPLICATION

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorneys to prosecute this application and transact all business in the United States patent and Trademark Office in connection herewith:

David E. Dougherty Registration No. 19,576 and Bruce H. Troxell Registration No. 26,592

Send Correspondence To:

Direct Telephone Calls To:
(name and telephone number)

Dougherty & Troxell
TWO SKYLINE PLACE
5203 LEESBURG PIKE, SUITE 600
FALLS CHURCH, VIRGINIA 22401-3401

Page 2 of 2

I hereby declare that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Joint Inventor's Signature	Date
Tsun-Tying HSU <i>T. T. Hsu</i>	Dec. 13, 1999

Residence	Citizenship
No. 111, Nanshan Rd., Sec. 1, Luchu, Taoyun, Taiwan, R.O.C.	Taiwan, R.O.C.

Post Office Address

same as the residence

Full Name of Second Joint Inventor	Inventor's Signature	Date

Residence	Citizenship

Post Office Address

Full Name of Third Joint Inventor	Inventor's Signature	Date

Residence	Citizenship

Post Office Address

Full Name of Fourth Joint Inventor	Inventor's Signature	Date

Residence	Citizenship

Post Office Address

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Tsun-Tying HSU

Serial No.: **Unassigned**

Filed: **December 15, 1999**

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FOR AN ELECTROMOTIVE VEHICLE**

CHANGE OF ADDRESS

Assistant Commissioner of Patents
Washington, D.C. 20231

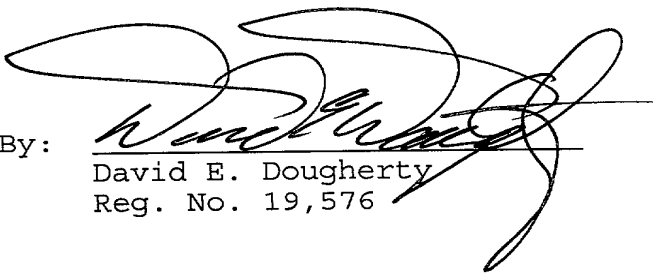
Sir:

Please forward all further correspondence in this application to DOUGHERTY & TROXELL at their new address as follows:

**DOUGHERTY & TROXELL
5205 LEESBURG PIKE
SUITE 1404
FALLS CHURCH, VIRGINIA 22041**

Respectfully submitted,

December 15, 1999
Date

By: 
David E. Dougherty
Reg. No. 19,576

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